

Tidal Volume Reduction In Patients With Acute Lung Injury When Plateau
Pressures Are Not High

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for the ARDS Clinical Trials Network

Online Data Supplement

Figure Legends:

Figure E1: Rate of pulmonary edema formation in intact rats after intrabronchial instillation of hydrochloric acid. Animals were ventilated for two hours after injury with tidal volumes of 6 ml/kg and end-expiratory pressure of 10 cm H₂O. Animals were then randomly assigned to one of the four ventilation strategies depicted. The rate of excess extravascular lung water was measured (ml/hr). Plateau pressures 4 hours after randomization have been superimposed in boxes on the figure. (*p < 0.05 compared with 3 ml/kg group, † p < 0.05 compared with the 6 ml/kg group, ‡ p < 0.05 compared with the 12 ml/kg PEEP 5 cm H₂O group) Reprinted with permission from Frank and colleagues (Reference E1).

Figure E2. Individual plateau pressures on day 1 after randomization of ARDS patients to low and standard tidal volume strategies (n = 116). Reprinted with permission from Brochard and colleagues (Reference E2).

Table E1. PATIENT BASELINE CHARACTERISTICS

Characteristic	Quartile 1		Quartile 2		Quartile 3		Quartile 4	
	Low	High	Low	High	Low	High	Low	High
N	99	101	95	104	97	95	97	99
Age	53.6 (+/-16.7)	54.7 (+/-17.8)	52.2 (+/-17.5)	51.2 (+/-17.3)	49.5 (+/-15.8)	50.1 (+/-19.5)	48.4 (+/-16.2)	50.6 (+/-16.3)
Female (%)	33.3	38.6	36.8	37.5	38.1	41.1	51.6	48.5
Ethnicity (%)								
White	76.8	70.3	74.7	75	78.4	76.8	70.1	61.6
Black	15.2	20.8	17.9	15.4	12.4	14.7	17.5	24.2
Hispanic	3	4	4.2	6.7	6.2	6.3	6.2	11.1
Other	5.1	5	3.2	2.9	3.1	2.1	6.2	3
APACHE III	78.1 (+/-24.3)	84.5 (+/-24.3)	81.5 (+/-27.7)	80.9 (+/-27.3)	79.3 (+/-26.4)	82.7 (+/-27.9)	87.0 (+/-32.4)	88.0 (+/-29.5)
n	99	99	93	104	97	95	97	98
PaO ₂ :FiO ₂	176 +/- 70	172 +/- 87	145 +/- 61	150 +/- 65	136 +/- 64	135 +/- 50	125 +/- 53	127 +/- 68
n	93	96	86	90	89	90	91	93
PaO ₂ :FiO ₂ < 200 (%)	69	71	84	84	85	89	87	89
Tidal Volume (ml)	670 (+/-128)	661 (+/-118)	686 (+/-120)	713 (+/-129)	675 (+/-107)	633 (+/-118)	663 (+/-130)	637 (+/-124)
n	73	78	71	70	72	59	62	70
Minute Ventilation (L/min)	13.2 +/-4.4)	12.1 (+/-4.4)	12.6 (+/-3.9)	12.6 (+/-4.2)	14.1 (+/-4.2)	13.3 (+/-4.0)	14.3 (+/-4.2)	13.0 (+/-4.3)
n	98	99	94	104	97	95	96	97
Nonpulmonary Organ or System Failures	1.2 (+/-1.0)	1.4 (+/-1.0)	1.3 (+/-1.0)	1.2 (+/-1.0)	1.3 (+/-1.0)	1.3 (+/-1.2)	1.6 (+/-1.1)	1.4 (+/-1.0)
n	84	87	75	82	91	82	76	83
Lung Injury								
Pneumonia	26	30	29	37	38	36	32	30
%	26.3	29.7	30.5	35.6	39.2	37.9	33.0	30.3
Sepsis	27	24	21	28	31	17	28	30
%	27.3	23.8	22.1	26.9	32.0	17.9	28.9	30.3
Aspiration	16	17	14	12	13	16	8	9
%	16.2	16.8	14.7	11.5	13.4	16.8	8.2	9.1
Trauma	12	10	12	9	7	8	17	6
%	12.1	9.9	12.6	8.7	7.2	8.4	17.5	6.1
Other	15	14	9	10	13	10	12	21
%	15.2	13.9	9.5	9.6	13.4	10.5	12.4	21.2
Transfusion	3	4	3	5	1	3	0	1
%	3.0	4.0	3.2	4.8	1.0	3.2	0.0	1.0

Low = lower tidal volume strategy. High = higher tidal volume strategy. APACHE III = Acute Physiology, Age, and Chronic health Evaluation (Reference E3). Scores can range from 0 to 299, with higher scores indicating more severe illness. APACHE III Score not available for 5 patients. PaO₂ = partial pressure of oxygen in mmHg. FiO₂ = fraction of inspired oxygen.

Figure E1

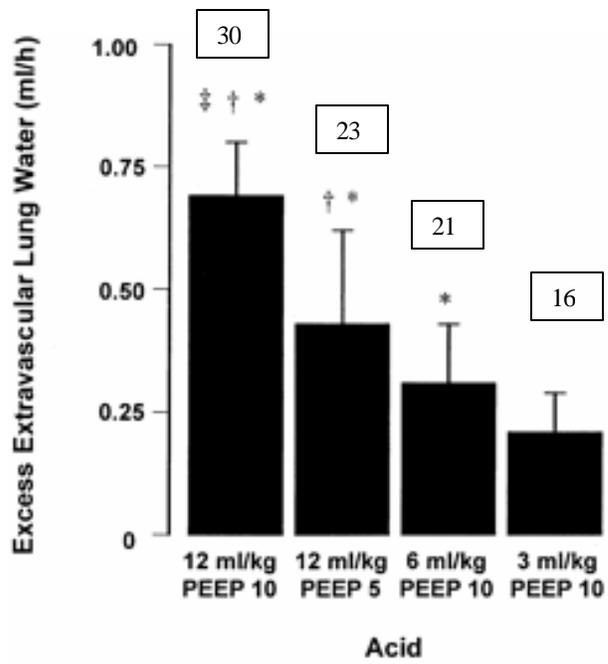
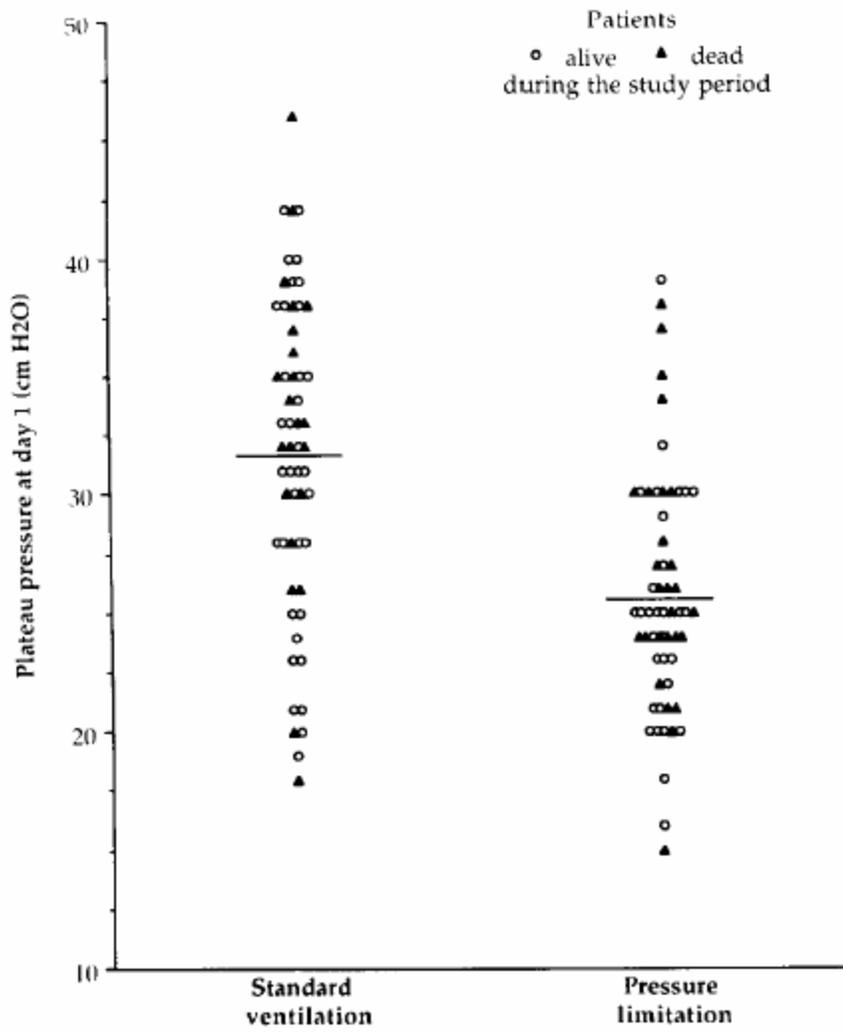


Figure E2



Reference List

- (E1) Frank JA, Gutierrez JA, Jones KD, Allen L, Dobbs L, Matthay MA. Low tidal volume reduces epithelial and endothelial injury in acid-injured rat lungs. *Am J Respir Crit Care Med* 2002; 165(2):242-249.
- (E2) Brochard L, Roudot-Thoraval F, Roupie E, Delclaux C, Chastre J, Fernandez-Mondejar E et al. Tidal volume reduction for prevention of ventilator-induced lung injury in acute respiratory distress syndrome. The Multicenter Trial Group on Tidal Volume reduction in ARDS. *Am J Respir Crit Care Med* 1998; 158(6):1831-1838.
- (E3) Knaus WA, Wagner DP, Draper EA, Zimmerman JE, Bergner M, Bastos PG et al. The APACHE III prognostic system. Risk prediction of hospital mortality for critically ill hospitalized adults. *Chest* 1991; 100(6):1619-1636.